

What is claimed is:

1. A pattern inspection apparatus for inspecting a pattern to-be-inspected by comparing the pattern to-be-inspected with a reference pattern, comprising:
  - a storage device for storing said reference pattern;
  - an image generator for scanning the pattern to-be-inspected with a charged particle beam to produce an image of the pattern to-be-inspected;
  - an input device for inputting the image of the pattern to-be-inspected;
  - an inspection device for inspecting the pattern to-be-inspected by comparing an edge of the inputted image of the pattern to-be-inspected and an edge of the stored reference pattern with each other; and
  - an output device for outputting a result of the inspection of the pattern to-be-inspected;
- wherein said image generator sets a scanning direction for the charged particle beam based on said reference pattern.

2. A pattern inspection apparatus according to claim 1, wherein said scanning direction for the charged particle beam is determined so as to be more perpendicular to all patterns to-be-inspected.

3. A pattern inspection apparatus according to claim 2, wherein said scanning direction for the charged particle

beam comprises a scanning direction which is  $\pm 90$  degrees with respect to the direction which is determined so as to be more perpendicular to said patterns to-be-inspected.

5           4. A pattern inspection apparatus according to claim 1, wherein said scanning direction for the charged particle beam is determined so as to be more perpendicular to most frequent directions of patterns to-be-inspected.

10           5. A pattern inspection apparatus according to claim 4, wherein said scanning direction for the charged particle beam comprises a scanning direction which is  $\pm 90$  degrees with respect to the direction which is determined so as to be more perpendicular to said patterns to-be-inspected.

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          6. A pattern inspection apparatus according to claim 1, wherein rotated image is acquired by replacing the position of pixels.

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          7. An image generating apparatus for generating an image of a pattern to-be-inspected by scanning the pattern to-be-inspected with a charged particle beam, comprising:

          means for scanning a given area of the pattern to-be-inspected to generate a hexagonal image thereof;

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          means for scanning an area, adjacent to said given area, of the pattern to-be-inspected to generate a next hexagonal image thereof; and

          means for repeatedly scanning successive areas of the

pattern to-be-inspected to generate a single image of a wide area of the pattern to-be-inspected.

8. A pattern inspection apparatus for inspecting a  
5 pattern to-be-inspected by comparing the pattern to-be-inspected with a reference pattern, comprising:

a storage device for storing said reference pattern;

an image generator for scanning the pattern to-be-inspected with a charged particle beam to produce an image  
10 of the pattern to-be-inspected;

an input device for inputting the image of the pattern to-be-inspected;

an inspection device for inspecting the pattern to-be-inspected by comparing an edge of the inputted image of  
15 the pattern to-be-inspected and an edge of the stored reference pattern with each other; and

an output device for outputting a result of the inspection of the pattern to-be-inspected;

wherein said image generator scans a wider area of  
20 the pattern to-be-inspected by imparting a vertical amplitude to a scanning direction for the charged particle beam.

9. A pattern inspection apparatus for inspecting a  
25 pattern to-be-inspected by comparing the pattern to-be-inspected with a reference pattern, comprising:

a storage device for storing said reference pattern;

an image generator for scanning the pattern to-be-

inspected with a charged particle beam to produce an image of the pattern to-be-inspected;

an input device for inputting the image of the pattern to-be-inspected;

5 an inspection device for inspecting the pattern to-be-inspected by comparing an edge of the inputted image of the pattern to-be-inspected and an edge of the stored reference pattern with each other; and

an output device for outputting a result of the  
10 inspection of the pattern to-be-inspected;

wherein said image generator scans only a pattern portion to-be-inspected to determine a deformation quantity of the pattern.

15 10. A pattern inspection apparatus according to claim 9, wherein said image generator scans only the pattern portion to-be-inspected to reduce a deformation of a profile due to a charge-up effect of the sample.

20 11. A pattern inspection method for inspecting a pattern to-be-inspected by comparing the pattern to-be-inspected with a reference pattern, comprising:

storing said reference pattern;

scanning the pattern to-be-inspected with a charged  
25 particle beam to produce an image of the pattern to-be-inspected, a scanning direction for the charged particle beam being set based on said reference pattern;

inspecting the pattern to-be-inspected by comparing

an edge of the produced image of the pattern to-be-inspected  
and an edge of the stored reference pattern with each other;  
and

outputting a result of the inspection of the pattern  
5 to-be-inspected.

12. A pattern inspection method for inspecting a  
pattern to-be-inspected by comparing the pattern to-be-  
inspected with a reference pattern, comprising:

10 storing said reference pattern;

scanning the pattern to-be-inspected with a charged  
particle beam to produce an image of the pattern to-be-  
inspected, a wider area of the pattern to-be-inspected being  
scanned by imparting a vertical amplitude to a scanning  
15 direction for the charged particle beam by said scanning;

inspecting the pattern to-be-inspected by comparing  
an edge of the produced image of the pattern to-be-inspected  
and an edge of the stored reference pattern with each other;  
and

20 outputting a result of the inspection of the pattern  
to-be-inspected.

13. A pattern inspection method for inspecting a  
pattern to-be-inspected by comparing the pattern to-be-  
25 inspected with a reference pattern, comprising:

storing said reference pattern;

scanning the pattern to-be-inspected with a charged  
particle beam to produce an image of the pattern to-be-

inspected, only a pattern portion to-be-inspected being scanned to determine a deformation quantity of the pattern by said scanning;

- 5 inspecting the pattern to-be-inspected by comparing an edge of the produced image of the pattern to-be-inspected and an edge of the stored reference pattern with each other; and

outputting a result of the inspection of the pattern to-be-inspected.